A QUICK METHOD OF TESTING FOR GOLD.

BY E. GOLDSMITH.

The volcanic rocks of the crater in which the towns of Cripple Creek and Victor, Colo., are built, according to Mr. Moore, the chief mining engineer of the district, all contain gold. The rock mined, however, is thrown on the dump and many thousands of tons, not worked for the gold at present, are piled up outside the mines.

The vein gold, in the form of sylvanite, telluride, and probably calaverite, is separated by hand from the gangue or rock and sent to the smelters for reduction. A specimen was secured from a depth of about 800 feet below the surface. Its general appearance was not very promising, inasmuch as the minerals were so finely divided that a mechanical separation for a test seemed to involve a waste of time. Separation, melting and cupellation are practiced extensively and are well known. A quicker and simpler method for at least a qualitative determination of the gold in the rock can, I think, be devised. Since these and other gold compounds are very fusible, it seemed probable that the small particles of the gold salts may be fused together before the blowpipe in the rock, and by shaking and driving with the pointed flame larger globules may be formed. This proves to be the case. During the process the tellurium and selenium, if present along with other volatile bodies, are roasted, *i. e.*, oxydized and expelled. The flame is bluish green. After the volatile substances are thus removed dark-colored globules project upward on the surface of the rock-splinter, which was about one inch long and a quarter of an inch thick. To clean these under the flame I covered the whole surface with cyanide of potassium, a reducing fire finishing this part of the work.

The rock-splinter was disintegrated; it broke easily and the globules of dark metal could be picked up with the pointed pincette or separated with a knife. These were put into the agate mortar and pressed and rubbed with the pistil to thin plates. A

little nitric acid was added and rubbed, then poured into a capsule; a second dose of nitric acid was given and worked as before. The gold appeared now, after washing with water, in its bright yellow color. The acid solution, after settling, poured cleanly into a test-tube, gave with a few drops of hydrochloric acid the well-known white precipitate of chloride of silver soluble in ammonia.

The gold was, as may be expected, in very thin plates, and, although not absolutely pure, showed the two distinct colors of the metal—the fine yellow by reflected light, and the violet color when a ray of ordinary light passed through it and was observed under the microscope by sunlight. By artificial light the color is modified to a greenish tint. The test of a gold-containing mineral in a rock, as described above, can be made within ten minutes. The microscopic part of the test is, of course, unnecessary, as the gold can be seen as readily without it after the treatment with nitric acid.

The ease and quickness of this blowpipe process and the little preparation required may recommend it to prospectors for gold ore, who, we are well aware, often overlook gold-containing minerals in the absence of an easy and simple test. The above-described method, if followed, may be found helpful, inasmuch as no new instrument or apparatus is required.

The finely and sparsely distributed gold compounds in the Cripple Creek volcanic rock have a similarity in appearance to common pyrites. In volcanic rocks, therefore, wherein both minerals may occur, the gold and iron compounds present can only be determined by the application of the proper tests.